In The Specification

Please delete the section labeled Cross-Reference to Related Applications beginning at page 1, line 6 and replace it with the following:

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a divisional application of pending application No. 10/139,710, filed May 6, 2002, which is continuation of pending Application No. 09/558,193, filed on April 26, 2000, which claims the benefit of Provisional Application No. 60/177,752 filed on January 24, 2000 and U.S. Provisional Application No. 60/184,006 filed on February 22, 2000, which applications are hereby incorporated by reference in their entireties.

Please delete the paragraph beginning at Page 5, line 11, and insert the following:

Because of this increase in electrical load, higher power demands are being placed on automotive alternator systems. Furthermore, the increasing power levels have motivated the adoption of a new higher distribution voltage in automobiles to augment and/or replace the current 14 V distribution system. In some cases, a single high-voltage electrical system may likely be used (e.g. a 42 volt electrical system). In other cases, a dual-voltage electrical system may be used which includes a first relatively high-voltage system (e.g. a 42 V electrical system) and a second relatively low-voltage system (e.g. a 14 V electrical system). The high-voltage electrical system will be used to power vehicle components which require a relatively large amount of power such as a starter motor of a vehicle. When retained (in the dual-voltage case), the low-voltage system will be used to power vehicle components that benefit from a low-voltage supply such as incandescent lamps and signal-level electronics.

Please delete the paragraph beginning at Page 15, line 15, and insert the following::

Fig. 5 is a flow diagram showing the steps to design an alternator in accordance with the present invention;

Please delete the paragraph beginning at Page 17, line 6, and insert the following:

Referring now to Fig. 1, an alternator system 10 having output terminals 10a, 10b includes a three phase alternator 12 having a field current regulator 14 and a switched-mode rectifier 16 coupled thereto. A field control circuit 14b regulates the output voltage at terminals 10a, 10b of the alternator system. The field control circuit includes a field current regulator 14 and a field controller 14a. The field current regulator 14 receives control signals from a field controller 14a and functions to regulate the output voltage at terminals 10a, 10b of the alternator system 10. The alternator 12 provides power along three signal paths 13a, 13b, 13c to the switched-mode rectifier circuit 16. The switched-mode rectifier receives the power from the alternator 12 and also receives a duty cycle control signal along path 16a from a switched-mode rectifier (SMR) control circuit 18. The SMR control circuit 18 receives sensing signals at an input terminal 18a from a speed sensor 20 which may be provided as a tachometer for example. The speed sensor 20 senses the engine speed or alternator speed and provides a frequency or speed signal to the SMR control circuit 18 along a signal path 18a. It should be appreciated that the speed sensor can sense any parameter or combination of parameters related to ac machine speed (e.g. engine speed, frequency, alternator speed, frequency, alternator back emf or back emf frequency, or any quantity from which the appropriate information can be observed or estimated) and provide an appropriate signal to the SMR control circuit. Based upon the frequency or speed of the alternator 12 the control circuit 18 provides duty signals along signal path 16a to control the operation (e.g. a duty ratio) of the switched-mode rectifier 16.

Please delete the paragraph beginning at Page 46, line 25, and insert the following:

It should be noted that switching profile of MOSFETs 58a' and 58b' must always provide a flow path for current directed into the center tap of the primary winding 122 of transformer 120. As a result, it must be ensured that switches 58a' and 58b' are never off simultaneously. To guarantee that MOSFETs 58a' and 58b' are never off together, there are intervals during the switching interval where both switches are on. These intervals are utilized for the switches to transition from there on states to their off states, or vice versa. For example, consider the case where MOSFET 58a' is on and MOSFET 58b' is off. Before turning MOSFET 58a' off and MOSFET 58b' on, MOSFET 58b' is turned on. During the interval both MOSFETs are on, the current flowing into the center tap of primary winding 122 of transformer 120 divides equally between section A and section B of primary winding 122. Furthermore, during this interval no current flows in the secondary windings 124 and 126 of transformer 120. The overlap on-time of the MOSFETs is chosen to allow smooth switch state transitions (on to off or off to on) for the switches while accounting for the finite state transition times for practical devices chosen for the particular application. The selected overlap time also provides the mechanism for controlling the average voltage across terminals d and e.

Please delete the paragraph beginning at Page 48, line 26, and insert the following:

When the MOSFETs 58a-58c are turned on, the current in the machine inductances increases, drawing energy from the low-voltage source and storing it in the machine inductances. When the MOSFETs 58a-58c are turned off, some of this energy plus additional energy from the low-voltage source is transferred to the high-voltage battery 102 through the diodes 56a-56c. The high-voltage battery 102 may be charged from a low-voltage source (for jump-starting purposes, for example) using this method.